

# The Rise of the Virtual Campus

California Council on Science and Technology

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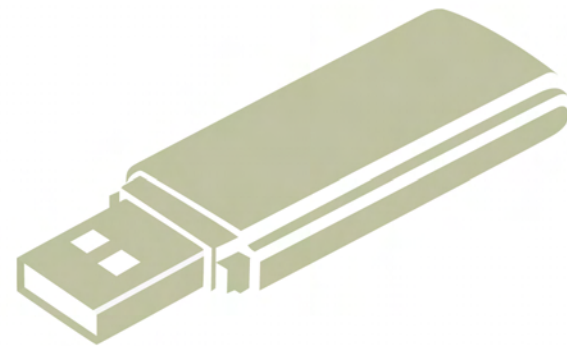


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# The Rise of the Virtual Campus Overview & Megatrends



One pick up truck load of books = 1 Gigabyte



Largest USB currently available = 256 Gigabytes

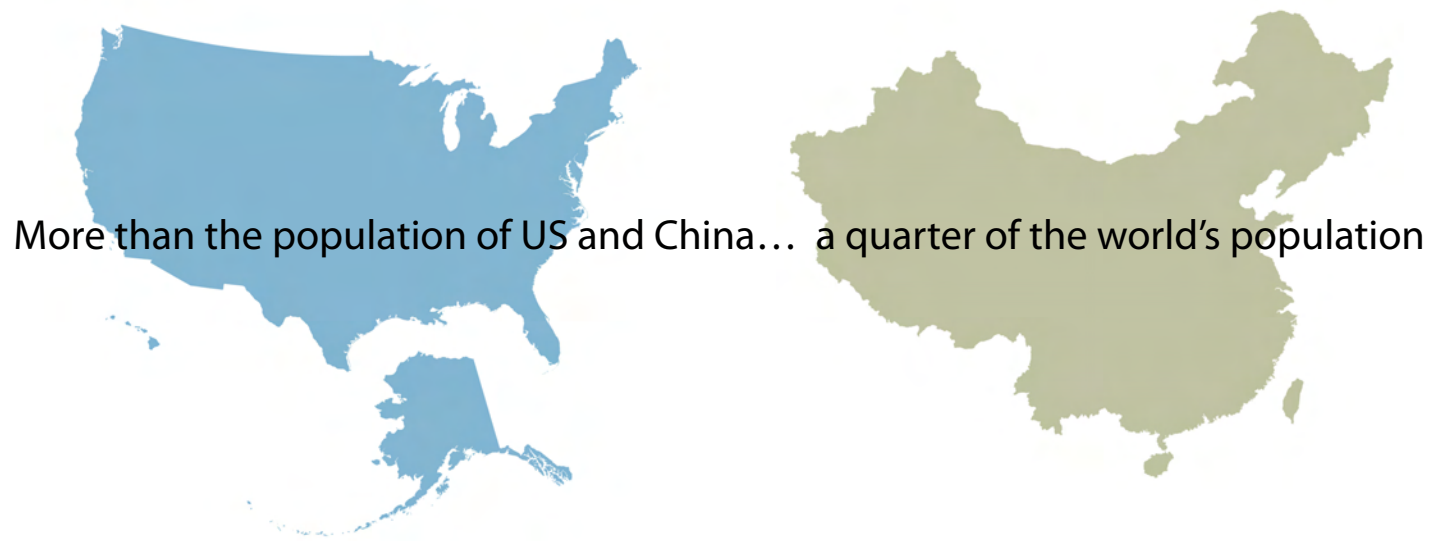


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# The Rise of the Virtual Campus

## Overview & Megatrends

**Internet users in 2009 > 1.6 billion**



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# The Rise of the Virtual Campus

## Overview & Megatrends

**Facebook users = 350 million**

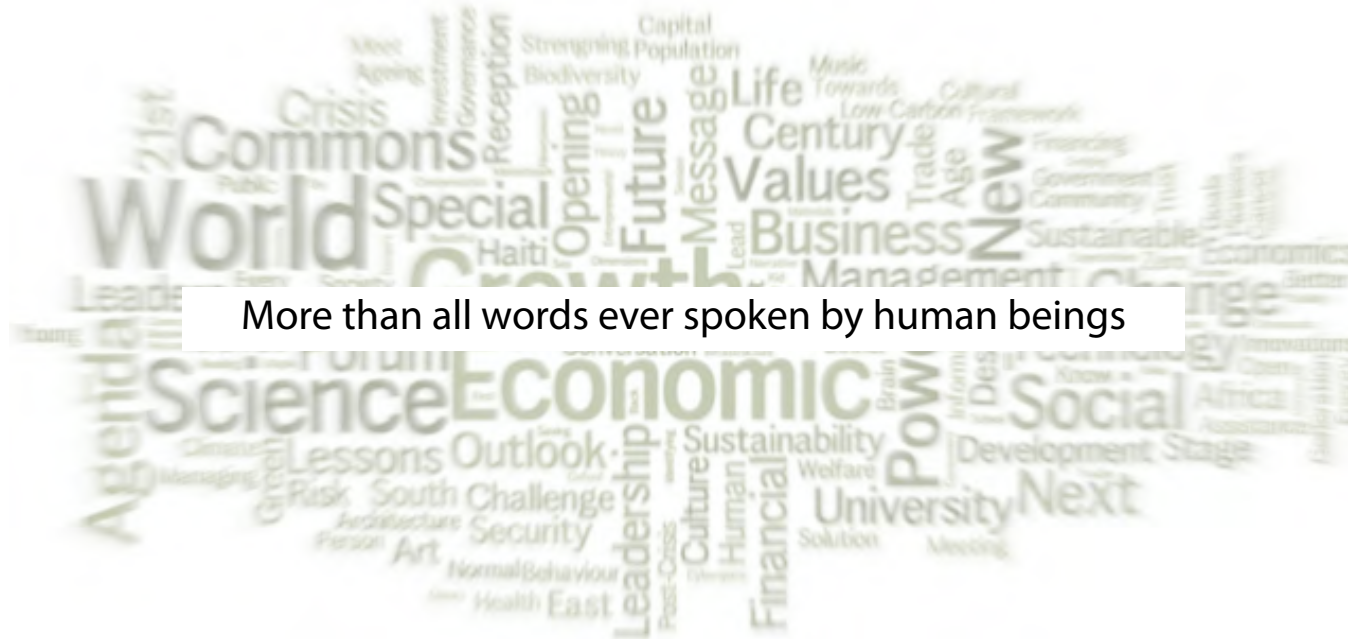


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# The Rise of the Virtual Campus

## Overview & Megatrends

**Global monthly Internet traffic = 5-8 exabytes of information (5-8 billion gigabytes)**

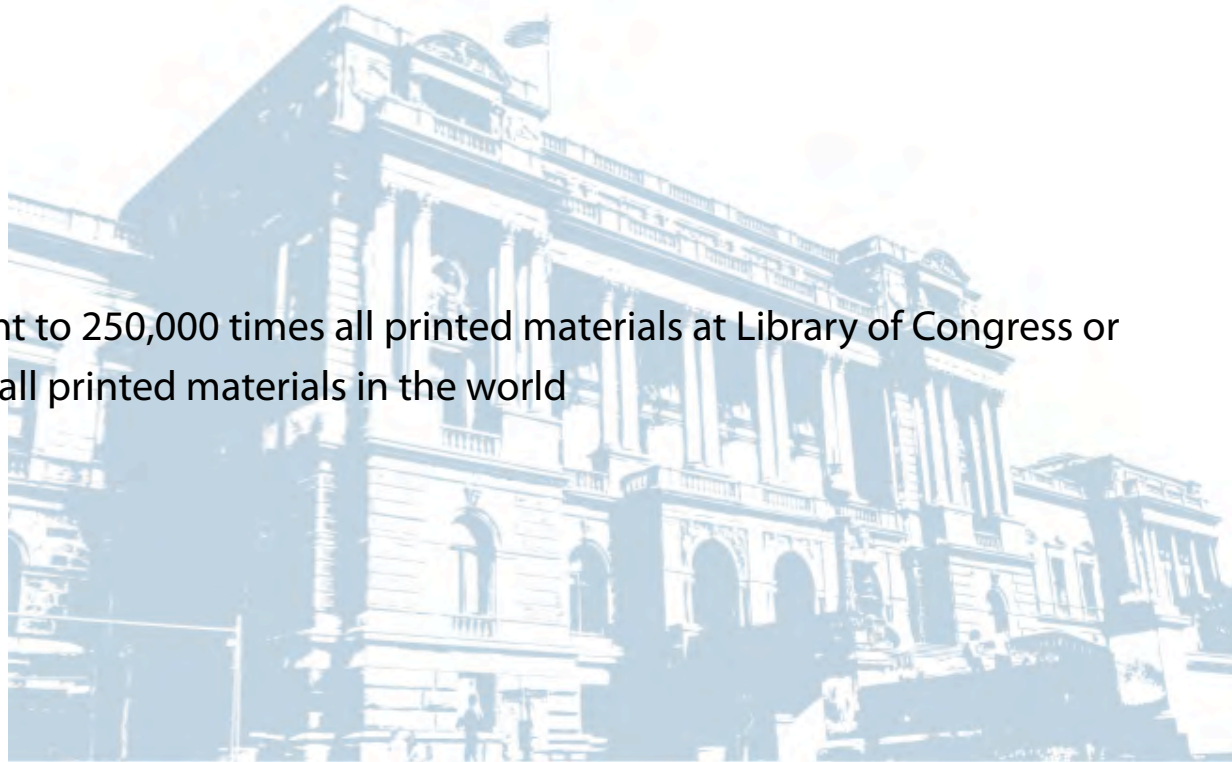


# The Rise of the Virtual Campus

## Overview & Megatrends

**4 exabytes of unique information generated and shared this year**

Equivalent to 250,000 times all printed materials at Library of Congress or  
20 times all printed materials in the world



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## Overview & Megatrends

**Current fiber-optic transmission capacity/speed > 14 terabits/second**

Speed triples every 6 months or 60,000 times every five years



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# The Rise of the Virtual Campus

## The Virtual Campus Solution

The future of learning requires a new paradigm  
— a collaborative, always-on, always-connected world:  
the STEM Virtual Campus.



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# The Rise of the Virtual Campus

## The Virtual Campus Solution

### Impacts of New Paradigm

- “The Death of Distance”
- Creating a learning society
- Imagineria & collaboratoria vs. lecture halls
- New role of the universities
- Learning ideagora



# The Rise of the Virtual Campus

## The Virtual Campus Solution

### **Fusion of Tradition & Transformation**

- The power of fusion
- Rich tradition of US higher education
- New capabilities of IT networks
- Creating a learning pandemic
- Virtual backpacks
- Communiversities

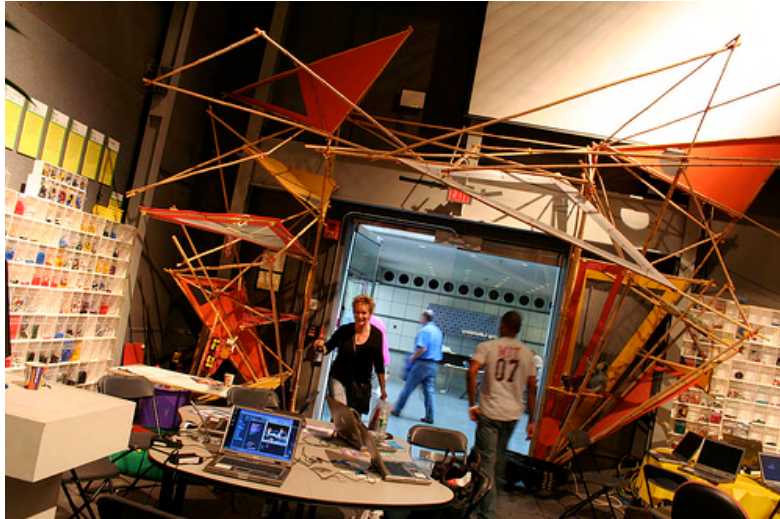


# The Rise of the Virtual Campus

## The Virtual Campus Solution

### What might a STEM Virtual Campus look like?

It could be envisioned as a virtualized and scalable version of MIT's New Media Lab



# The Rise of the Virtual Campus

## The Virtual Campus Solution

**Built on “cloud” infrastructure vs. traditional “bricks & mortar” campus**

Σ(CENIC, Internet2, National LambdaRail) + Cloud Computing

= Ideal infrastructure for STEM Virtual Campus



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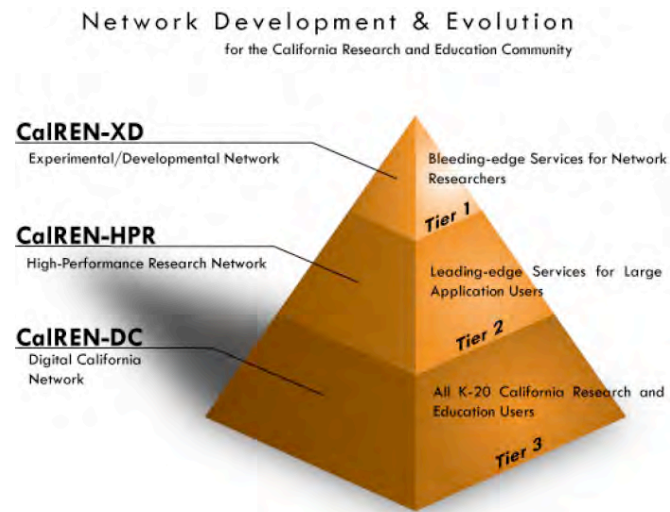
# The Rise of the Virtual Campus

## The Virtual Campus Solution

### CENIC's network is multi-tiered

CalREN (California Research & Education Network)

Serves K-20 (public & private) statewide



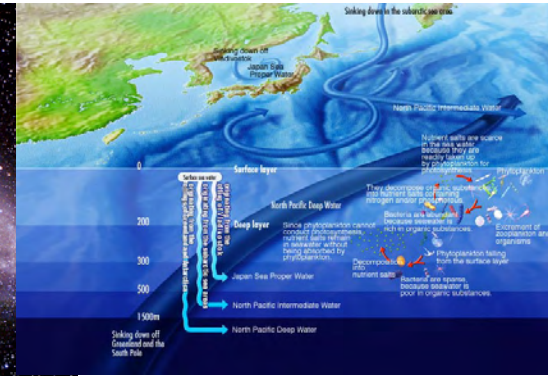
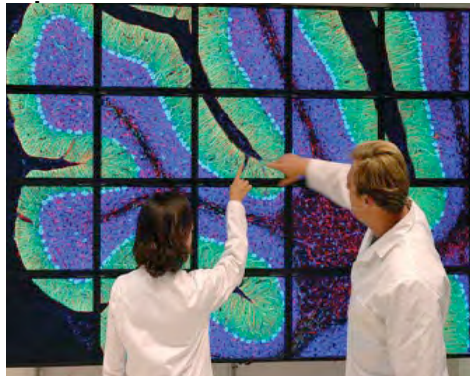
# The Rise of the Virtual Campus

## The Virtual Campus Solution

**CalREN provides access to instrumentation and information resources from anywhere**

Visualization & remote access to data sets

Astronomy & deep ocean science

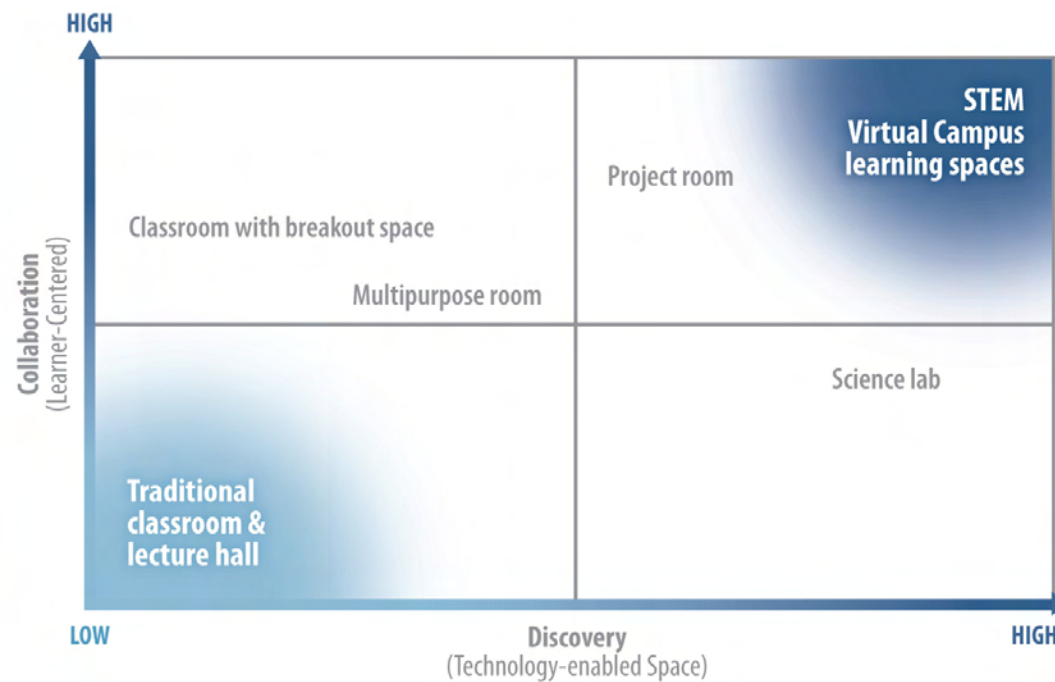


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# The Rise of the Virtual Campus

## The Virtual Campus Solution

**How would learning spaces within a STEM Virtual Campus differ from a traditional campus?**



# The Rise of the Virtual Campus

## The Virtual Campus Solution

### Who might serve as anchor tenants within the STEM Virtual Campus?

- Teaching and research universities, national labs, the New Media Lab, and Calit2...



- Open Cloud Consortium and industry partners such as Microsoft, Cisco, Google, Oracle



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## The Virtual Campus Solution

### **What's the focus of the STEM Virtual Campus?**

- Project-based learning...
- Enriched through cyberinfrastructure-enabled peer-to-peer and team-based collaborations



# The Rise of the Virtual Campus

## The Virtual Campus Solution

### **What are the implications for teaching and learning?**

- Remote access to Internet-based instruments, data sets, and experiments provides opportunities for faculty to model disciplinary thinking for their students
- Students motivated by participation in communities focused on complex problems



# The Rise of the Virtual Campus

## The Virtual Campus Solution

### **Workforce development implications of STEM virtual campus**

- Provides ubiquitous learning environment encompassing classrooms, labs, libraries, galleries, museums, zoos, workplaces, homes, and many other locations
- Becomes highly leveraged component of society where people learn as routine part of life



# The Rise of the Virtual Campus

## The Virtual Campus Solution

### **California State University, East Bay**

- Regional stewardship
- Excellence by inclusion and digital equalizer
- Accomplish goals via:
  - Offering online education
  - Implementing virtual labs
  - Utilizing Internet II for global experiments
  - Promoting virtual teams
  - Proliferating learning ideagora



# The Rise of the Virtual Campus

## The Virtual Campus Solution

### **CSUEB Focus is STEM Education**

- Technological competency
- Backbone of logic and analytic thinking
- Systematic problem solving skills
- Graduating diverse group of work-ready professionals
- Partnership with key stakeholders



# The Rise of the Virtual Campus

## The Virtual Campus Solution

### **CSUEB's Solution for a Creating a Learning Society**

Building a P-20 "cradle to career" partnership where students:

- Are prepared for school through early childhood education
- Are supported inside and outside school
- Succeed academically
- Enroll in post-secondary education
- Graduate and enter careers



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# The Rise of the Virtual Campus

## The Virtual Campus Solution

### **Concluding Remarks**

Degree of alignment will determine success

- Learning Society will be framework of vibrant economy, thriving communities



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“It is not the strongest of the species that survives, nor the most intelligent, but the one most responsive to change.”



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Thank You.

For more information

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